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Attorney Docket No.: 101769-137 tesa 1525-WCG
2100 Dr.He-ar

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Marc Husemann, et al.
Serial No.	:	10/077,658
Filed	:	February 15, 2002
For	:	LOW-OUTGASSING ACRYLIC PRESSURE-SENSITIVE ADHESIVE COMPOSITIONS
Art Unit	:	1771
Examiner	:	Elizabeth M. Cole

June 23, 2006

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SECOND AMENDED BRIEF ON APPEAL PURSUANT TO 37 CFR § 41.37

Sir:

This Second Amended Brief on Appeal is being filed in response to the two Notifications of Non-Compliant Appeal Brief, both dated June 14, 2006, wherein it was indicated that the Brief failed to contain a statement of the status of all claims, because the status of claims 5-8 was not indicated.

The "Status of Claims" section herein has now been amended to reflect the status of said claims, as recited in the Office Action of March 17, 2006.

This is an appeal from the final rejection of an Examiner of Art Unit 1771.

1. REAL PARTY IN INTEREST

The instant application is owned by tesa AG, record owner hereof.

2. RELATED APPEALS AND INTERFERENCES

The undersigned is not aware of any appeals, interferences, reexaminations, infringement actions or the like in any related applications.

3. STATUS OF CLAIMS

The claims pending in this application are claims 1-3 and 5-13. All of said claims are finally rejected, and all of said claims are on appeal.

4. STATUS OF AMENDMENTS

The last amendment to the claims was that filed on April 7, 2005 and that amendment was entered. Further responses were filed on September 8, 2005 and September 27, 2005, but those responses did not include any amendments. There are no outstanding amendments.

5. SUMMARY OF THE CLAIMED SUBJECT MATTER

Independent claim 1 relates to a novel UV crosslinked (page 5, lines 1-3) polyacrylate pressure-sensitive adhesive composition having a residual volatile component fraction of less than 50 µg/g (page 4, lines 16-18).

Independent claim 3 pertains to a process for preparing the UV crosslinked pressure-sensitive adhesive composition of claim 1, which comprises adding an entrainer to polyacrylate solution, passing the solution through an extruder in which the solution is subjected to carrier distillation (page 5, lines 18-23), adding more entrainer and carrying out a further carrier distillation in the extruder (page 6, lines 22-27) and then crosslinking (page 8, lines 20-24).

Independent claim 9 pertains to an adhesive tape comprising a backing material having the novel UV-crosslinked pressure-sensitive adhesive composition of the invention applied to one or both sides (page 7, lines 28-35; page 8, lines 9-18; page 9, lines 21-19).

6. GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL

The grounds for rejection to be reviewed on appeal are

A) The rejection of claims 1, 2 and 9-11 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over DE 19807752 to Harder et al (equivalent to US 6,432,529), and

B) The rejection claim 3, and 5-13 under 35 U.S.C. 103(a) as obvious over Harder et al DE 19807752 (= US 6,432,529) in view of Harder et al DE 4313008 (equivalent to U.S. 6,613,870) and further in view of Meyer-Roscher et al (U.S. 6,242,504)

7. ARGUMENTS

A) The rejection of claims 1, 2 and 9-11 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over DE 19807752 to Harder et al (equivalent to US 6,432,529).

Appellants' claims concern a pressure-sensitive adhesive which has an extremely low content of residual volatiles. This is a very significant development for adhesive tapes to be used in the electronics industry. The importance of this development is pointed out by Appellants In the paragraph beginning at page 2, line 9:

> For industrial applications, especially in the electronics sector, temperature-stable, shearing-resistant acrylic PSA tapes with very low outgassing are required. Residues of solvent and residual monomer may evaporate out during application at elevated temperatures, with the consequence that the atmosphere may contain solvent. This can give rise to a variety of problems. One is that certain monomers possess good conductivity, so that the risk of short circuits increases. Another is that the solvents and/or monomers may bring about the destruction of plastic parts and insulators. In this sector, therefore, attempts are made to use very high-purity acrylic PSA tapes which possess extremely low outgassing tendencies.

Clearly, the need set out is for adhesives that have extremely low outgassing components; and not just low "fogging numbers". Fogging numbers pertain to condensable components that evaporate from e.g. plastics and leave a film on e.g.

automobile windshields. The present invention goes far beyond simply low fogging numbers. As can be seen from the foregoing text, the presence of ***any*** volatiles in the atmosphere, is a concern. Those skilled in the art clearly recognize that such volatiles can be present in the atmosphere even if non-detected by standard "fogging number" tests, which detect only those which condense out under the conditions of the test. More specifically, those skilled in the art will recognize that an atmosphere having a 0 fogging number can still be contaminated with volatile components in sufficient amounts to be of concern to the electronics industry, as indicated by the text above. Note that the concern is with "outgassing tendencies", and not merely with "fogging tendencies".

By contrast, Harder '529 measures "fogging numbers" by placing a sample in a glass beaker, covering the beaker with a cooled glass plate and placing the beaker in a bath maintained at a temperature of 100°C., and measuring the amount of condensate that accumulates on the glass plate (col. 1, lines 26-39). Those skilled in the art know, of course, that volatiles which are not condensable under these conditions will not be detected, and therefore that a sample having a 0 fogging number can still have a substantial amount of volatile materials present.

The amount of volatiles present in Appellants adhesives, by contrast, are measured by GC-MS (page 10, paragraph beginning at line 9). Appellants clearly measure, and direct their claims to, ***total*** volatiles, and not just to the portion that is condensable and detectible by the "fogging" test.

No person skilled in the art reading the Harder reference, and his means for determining "fogging numbers" would ever conclude that a zero fogging number, as determined by Harder, would suggest anything at all about the amount of *total* volatiles present, within the meaning of Appellants' claims.

The Examiner contends that Harder discloses the same composition as that claimed by Appellants, and that the same material can not have different properties. The fact of the matter is, however, that different treatment of the same or similar compositions can, in fact, lead to different properties.

Appellants have previously drawn the Examiner's attention to their Example 1 (Amendment of April 7, 2005, page 5, last paragraph). The adhesive of Appellants' Example 1 is equivalent to Harder's resin in that it is a conventional acResin, which also has ca. 0.3 mg volatiles if it were measured by the VW test. As can be seen in table 2, page 12 of the present specification, the resin of Example 1, when tested by the test method described at page 10, had an outgassing of 150 µg/g, which is far in excess of the limitation of Appellants' claim 1.

Appellants also pointed out to the Examiner that when a resin of this type is crosslinked by conventional UV-C radiation, the resin sustains fragmentation, and the amount of volatiles increases. This can be seen by a comparison of the results for Example 1 to those of Examples 2 and 3 and by comparing the results of Example 4 to those of Example 5. Example 4 shows an outgassing level of 5 µg/g; but when this

resin is irradiated by conventional UV-C radiation, the outgassing is increased to 61 µg/g.

By contrast, Appellants' resin (Example 6), when crosslinked by UV-A radiation, had an outgassing level of only 9 µg/g. Note that Appellants' claim 3 recites UV-A radiation.

The prior art uses conventional UV-C radiation for crosslinking of resins of this type, and there is nothing in the prior art that would teach or suggest the advantages of crosslinking by UV-A radiation, or that a crosslinked (meth)acrylic pressure-sensitive adhesive could be prepared with an outgassing level below 50 µg/g by any means.

Nothing in the prior art teaches or suggests any UV crosslinked (meth)acrylic pressure sensitive adhesives with an outgassing level this low.

As a matter of fact, at no point does Harder ever teach anything at all about the actual amount of volatiles present in his adhesive compositions.

There is therefore absolutely no basis for the Examiner's conclusion that Harder anticipates or renders Appellants' claims obvious, inasmuch as Harder does not teach or suggest anything about a residual volatile component fraction of less than 50 µg/g.

With respect to the burden of proof, it is respectfully submitted that Appellants

have met that burden. Appellants have explained, and the specification discloses, that the adhesive compositions are devolatilized by purification in an extruder and a further postpurification step, in an extruder, with the aid of entrainers, to achieve the low level of volatiles. Harder, by contrast, does not use an entrainer, and Harder never mentions anything at all about the total amount of volatiles present. Harder is not concerned with all volatiles; only those that condense out to produce a "fogging" effect. Those skilled in the art will recognize that these could be only a fraction of the total amount of volatiles present.

The fogging numbers reported by Harder do not provide any evidence that he could in any way achieve Appellants' low levels of volatiles, as nowhere does the reference relate fogging numbers to actual amounts of volatiles.

In the Advisory Action of September 9, 2005, the Examiner argues that Harder teaches at col. 7, lines 1-20 that the tape should preferably comprise no volatile residues.

In their response of September 27, 2005, Appellants respectfully asked the Examiner to review the ***entire*** context of the example that is discussed at col. 7, lines 1-20. More specifically, Appellants pointed out to the Examiner that the language at col. 6, lines 25-28 and 51-56 clearly shows that the "residues" referred to at col. 7, lines 1-20, are residues of adhesive, which are left behind on a substrate when the adhesive tape is removed from a substrate to which it has been bonded.

This is <u>not</u> a measure of volatile content, it is a measure of e.g. cohesiveness.

Clearly, Harder does not teach, suggest or achieve the low levels of volatiles that Appellants' claims require.

The rejection of claims 1, 2 and 9-11 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over DE 19807752 to Harder et al (equivalent to US 6,432,529) should accordingly be REVERSED.

B) **The rejection of claims 3 and 5-13 under 35 U.S.C. 103(a) as obvious over Harder DE 19807752 (=US 6,432,529) in view of Harder DE 4313008 (=US 6,613,870) and further in view of Meyer-Roscher et al. (U.S. 6,242,504)**

The Examiner sees Harder '752 (USS 6,432,529) as disclosing an acrylic pressure-sensitive adhesive, but as not disclosing the claimed method of making the adhesive and the tape. Harder '008 (US 6,613,870) is seen by the Examiner as disclosing that acrylic adhesives may be made by free-radical polymerization and that an entrainer may be employed to further concentrate the polymerizate (office action of May 3, 2004). The Examiner then cites the '504 reference for the use of UV-A radiation.

Note, however, that the Example of Harder 008 produces a product having a volatiles content of 0.8%, which is far above that presently claimed.

In addition, Meyer-Roscher et al. is concerned with "controlled-dose exposure" to

optimize PSA properties such as tack, peel resistance and sheer strength. Nothing in this reference teaches or suggests that UV-A radiation is less prone to form volatiles than other kinds of radiation (page 8, lines 29-31). Therefore, there is no reason why one would use Meyer-Roscher's UV-A radiation for the Harder '529 adhesive tapes. This is especially true in view of the fact that Harder '529 already uses four medium-pressure Hg lamps to vary the degree of crosslinking by way of UV dose (col. 6, lines 6-8).

Appellants' process therefore cannot be seen as obvious over any combination of Harder '529, Harder '870 and Meyer-Roscher et al. '504. The rejection of claim 3 and 5-13, under 35 U.S.C. 103(a) as obvious over Harder DE 19807752 (=US 6,432,529) in view of Harder DE 4313008 (=US 6,613,870) and further in view of Meyer-Roscher et al. (U.S. 6,242,504) should accordingly now be REVERSED.

8. CONCLUSION

Wherefore it is submitted that the final rejection is in error and should be **REVERSED**.

AUTHORIZATION TO CHARGE FILING FEE TO DEPOSIT ACCOUNT

Appellant is:

[ ] a small entity

[X] other than a small entity

It is requested that the fee for the filing of the Brief on Appeal be charged to the undersigned's Deposit Account No. 14-1263.

Please charge:

[ ] $ 250.00 for small entity

[X] $500.00 for other than small entity.

CONDITIONAL PETITION FOR EXTENSION OF TIME

If any extension of time for this response is required, appellant requests that this be considered a petition therefor. Please charge the required Petition fee to Deposit Account No. 14-1263.

ADDITIONAL FEE

Please charge any insufficiency of fees, or credit any excess to our Deposit Account No. 14-1263.

Respectfully submitted,
NORRIS McLAUGHLIN & MARCUS, P.A.

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I hereby certify that this correspondence is being transmitted via facsimile, no. 571-273-8300 to the United States Patent and Trademark Office, addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 23, 2006.

By _____
William C. Gerstenzang
Date June 23, 2006

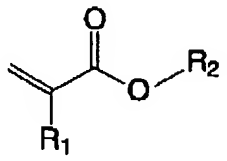
9. CLAIMS APPENDIX

The claims are appeal read as follows:

Claim 1. A UV crosslinked pressure-sensitive adhesive composition comprising polymers, copolymers, or both, based at least predominantly on (meth)acrylic acid, derivatives thereof, or both, wherein said crosslinked pressure-sensitive adhesive composition comprises a residual volatile component fraction of in total less than 50 µg/g, as measured by the tesa method.

Claim 2. The UV crosslinked pressure-sensitive adhesive composition as claimed in claim 1, wherein the polymers, copolymers or both are prepared using at least the following monomers:

(a) from 65 to 100% by weight of acrylic acid derivatives, methacrylic acid derivatives, or both, of the general formula



where R_1 = H or CH_3 and R_2 = an alkyl chain of 2 to 20 carbon atoms,

(b) from 0 to 35% by weight of vinyl compounds containing functional groups.

Claim 3. A process for preparing a UV crosslinked pressure-sensitive adhesive composition as claimed in claim 1, using a polyacrylate solution obtainable by free-radical addition polymerization, which comprises

a concentration step in which

- after polymerization, an entrainer is added to the polyacrylate solution,
- the entrainer-admixed polyacrylate solution is passed into an extruder in which said solution is subjected to a carrier distillation,
- in at least one further step following concentration, a postpurification step is conducted by adding the same entrainer again, or a further entrainer, to the concentrated polyacrylate composition and carrying out a further carrier distillation in the extruder,
- the concentration thus produces a polyacrylate composition which is processed further from the melt, and
- the polyacrylate composition is crosslinked by exposure to UV-A radiation.

Claim 4 (canceled).

Claim 5. The process as claimed in claim 3, wherein at least the extruder in the concentration step is a corotating or counterrotating twin-screw extruder.

Claim 6. The process as claimed in claim 3, wherein steam is used as entrainer.

Claim 7. The process as claimed in claim 3, wherein

- the concentrated polyacrylate composition is applied to a backing material
- and the polyacrylate composition on the backing material is subjected to a crosslinking reaction.

Claim 8. The process as claimed in claim 7, wherein

crosslinking is carried out using UV light in a wavelength range from 250 to 400 nm, with the proviso that the output of light in the wavelength range from 300 to 400 nm makes up at least 70% of the total irradiated light output.

Claim 9. An adhesive tape comprising a backing material having a UV crosslinked pressure-sensitive adhesive composition as claimed in claim 1 or 2 applied to one or both sides.

Claim 10. The adhesive tape as claimed in claim 9, comprising a backing material having an outgassing tendency of less than 5 µg/g.

Claim 11. The UV crosslinked pressure-sensitive adhesive composition of

claim 1, wherein said volatile component fraction is less than 10 µg/g.

Claim 12. The process of claim 3, wherein said further carrier distillation is conducted at higher temperatures and lower vacuums than the preceding distillation.

Claim 13. The process of claim 8, wherein the light in the wavelength range of 300 to 400 nm makes up at least 90% of the total irradiated light output.

10. EVIDENCE APPENDIX

No evidence under §§ 1.130, 1.131, or 1.132 has been submitted.

11. RELATED PROCEEDINGS APPENDIX

There have been no decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 CFR 41.37